

REMARKS

This paper is responsive to the Office Action mailed September 26, 2002. Reexamination and reconsideration of the application are respectfully requested.

The Office Action

In the Office Action of September 26, 2002:

claim 7 was objected to because of a typographical error;

claims 1, 4-5 and 18-22 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent No. 5,905,811 to Shiiyama, et al. ("Shiiyama");

claims 2 and 7 were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of U.S. Patent No. 5,701,498 to Goach, et al. ("Goach");

claims 3 and 8 were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of U.S. Patent No. 5,918,024 to Kitaori, et al. ("Kitaori");

claim 6 was rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of U.S. Patent No. 5,845,305 to Kujiraoka ("Kujiraoka");

claims 9-15 were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of U.S. Patent No. 5,438,657 to Nakatani ("Nakatani");

claim 16 was rejected under 35 USC §103(a) as being unpatentable over Shiiyama as modified by Nakatani and in further view of U.S. Patent No. 4,903,229 to Schmidt, et al. ("Schmidt");

claim 17 was rejected under 35 USC §103(a) as being unpatentable over Shiiyama as modified by Nakatani and in further view of U.S. Patent No. 6,064,397 to Herregods, et al. ("Herregods").

The Present Application

By way of brief review, the present application is directed to a system and method for automatic and semi-automatic document indexing. The invention is useful where a large document is scanned to generate an electronic version of the document. For example, the invention is used to generate a table of contents or an index for the electronic version of the document (for example, see FIG. 1). A subsection delimiter definition is determined that is related to the document.

For example, a review of a document may indicate that chapter headings are rendered in an 18-point font at a text location that is centered on a page and is two inches below the top of the page. Then a first subsection delimiter may be defined as text located two inches from the top of a page and rendered in an 18-point font.

Subheadings can occur anywhere on a page but are rendered in a 16-point font with underlined characters. Then, a second subsection delimiter may be defined as underlined 16-point text.

Once one or more subsection delimiters are defined, the electronic version of the document is searched to find occurrences of text matching the defined subsection delimiters. Information regarding each occurrence is used to create an index or table of contents for the document. For example, for each occurrence of 18-point text located two inches from the top of a page, the text string associated with the occurrence is recorded in association with a text location of the occurrence. For example, the text "CHAPTER ONE" is associated with a page number, such as page 3, and is recorded and included in the index or table of contents. The text location information may be recorded in the form of a hypertext link. Similarly, the text and text location associated with each occurrence of underlined 16-point text is recorded and added to the index or table of contents. For example, the text location recorded may include a page number as well as an indication of a location within the page. Again, the text location information may be recorded in the form of a hyperlink.

Cited References

It is submitted that the principle reference of the Office Action to Shiiyama discloses a system and method for generating an electronic index for document images. In the system of Shiiyama, instead of describing characteristics of items to be indexed in general terms and having the system automatically find specific occurrences of document portions matching those general descriptions, each and every word or "character key" that is to be included in the index (see step S21). Shiiyama mentions the word "delimiter." However, Shiiyama does not disclose or suggest a subsection delimiter. Instead, the delimiter of Shiiyama is used to indicate portions of a document at which an optical character recognition process assigns only a low probability that a character recognition was accurate (column 2, lines 60-64). Where the likelihood that a recognized character is correctly recognized is low, the method of Shiiyama provides a set of possible characters. The delimiter of Shiiyama is used to indicate the beginning and end of that set. In this regard, the delimiter of Shiiyama is a -- poor recognition -- delimiter and not a -- subsection -- delimiter.

Furthermore, Shiiyama does not disclose or suggest searching a document for the delimiter. Instead, Shiiyama discloses searching an index for a word or "character key."

If, while searching for characters matching the character key, a delimiter is encountered in association with a plurality of possible recognized characters, Shiiyama assumes a successful match if any of the possible characters match the associated character in the character key or search word (column 4, line 58 – column 5, line 22).

In this regard, Shiiyama does not disclose or suggest searching a document to find occurrences corresponding to a defined subsection delimiter nor creating an index for a document from found occurrences corresponding to the subsection delimiter.

Goach discloses a method and apparatus for on-line presentation of BOOKMASTER-based publications on an ASCII terminal. Goach uses the phrase -- chapter delimiter --, however, Goach does not disclose or suggest the delimiter is a font size, a font, a text string, a text location nor a specific point within a document. It is respectfully submitted that Goach does not disclose or suggest that a delimiter take any particular form whatsoever.

Kitaori discloses an apparatus for adding an electronic signature to document data. An author or authorship device of an author adds a delimiter for dividing the document into a plurality of document sections. Signatures are associated with each document section. It is respectfully submitted that Kitaori is unconcerned with a printed version of the document. Additionally, it is respectfully submitted that Kitaori does not disclose or suggest determining a subsection delimiter comprises using a symbol representing a demarcation point on a printed version of the document. Furthermore, Kitaori does not disclose or suggest displaying a plurality of document pages on a user interface, selecting at least one demarcation point on at least one of the plurality of pages, and using the at least one demarcation point as a defined subsection delimiter.

Kujiraoka discloses an index-creating apparatus.

Nakatani discloses a document processing apparatus for extracting a format from one document and using the extracted format to automatically edit another document. Nakatani is not concerned with generating an index for a document.

Schmidt discloses a forms-generating and information retrieval apparatus comprising a compact disc for storing machine readably a plurality of form files and magnetic media for storing machine readably a plurality of information files. Schmidt is unconcerned with generating an index for a document.

Herregods discloses a method for creating multiple documents having identical background regions and page-specific image regions. Herregods is unconcerned with generating an index for a document.

The Claims are in Proper Form

Claim 7 was objected to due to a typographical error. The Applicant is grateful to the Examiner for pointing out the error. **Claim 7** has been amended to correct the typographical error.

The Claims are Unanticipated

Claims 1, 4-5 and 18-20 were rejected under 35 USC §102(b) as being anticipated by Shiiyama. **Claim 1** has been amended to recite a method operative to automatically generate an index for a document, the method comprising the steps of determining a subsection delimiter definition, searching the document to find occurrences of items corresponding to the defined subsection delimiter, and creating the index for the document from the found occurrences of items corresponding to the subsection delimiter.

In rejecting **claim 1**, the Office Action asserts the Shiiyama discloses searching a document to find occurrences of a defined subsection delimiter. The Applicant respectfully disagrees. In support of the assertion, the Office Action directs the attention of the Applicant to column 3, lines 38-44, of Shiiyama. However, the referenced section explains what happens during a search for text matching a character key and not a search for a delimiter. Referring to FIG. 2 of Shiiyama, it is respectfully submitted that the typical processing steps of the process of Shiiyama include steps S21-S25, S27-S29. Additionally, it is respectfully submitted that FIG. 2 of Shiiyama is incorrect. The path leading away from decision box S28, labeled NO, should flow to the arrow above box S24 and not decision box S25. As FIG. 2 is drawn, the process never reads more than one character. In any event, as can be seen from decision box S28, the goal of the process of FIG. 2 of Shiiyama is to form a character key. The goal of the process of FIG. 2 is not to find delimiters. When it is judged the character code indicates a delimiter S25, a plurality of candidates up to the next delimiter are combined with the character train so far, thereby developing a plurality of character keys (column 3, lines 39-45). Clearly, Shiiyama discloses searching the document to find occurrences matching entered character keys. It is respectfully submitted that Shiiyama does not disclose searching the document to find occurrences of items corresponding to the defined subsection delimiter.

The Office Action also asserts that Shiiyama discloses when it is judged that the character key is completed, the formed character key is added to the index information.

The Applicant respectfully agrees. However, such disclosure is not a disclosure of creating an index for the document from the found occurrences of items corresponding to the subsection delimiter. As explained above, the index of Shiiyama is based on matched character keys. The delimiter of Shiiyama is used in an attempt to compensate for poor character recognition so that when words corresponding to manually entered character keys are poorly recognized, they may still be referenced in an index. It is respectfully submitted that Shiiyama suggests it is better to have an index with incorrect extra entries than to have an index that is incorrect because it is missing entries.

For the foregoing reasons, **claim 1**, as well as **claims 2-8** which depend therefrom, is unanticipated and unobvious in light of Shiiyama.

Additionally, **claim 4** has been amended to recite searching the electronic version of the document for one of characters and objects that correspond to the defined subsection delimiter. As explained above, the searching of Shiiyama is for character strings that match an entered character key. Shiiyama does not disclose or suggest searching for a delimiter or characters in objects that correspond to a delimiter. Instead, Shiiyama discloses reacting to the discovery of a delimiter while searching for strings that match character keys.

For the foregoing reason, **claim 4**, as well as **claim 5** which depends therefrom, is unanticipated and unobvious in light of Shiiyama.

Claim 18 has been amended to recite searching the electronic version to find occurrences of items that correspond to the defined subsection delimiter and using the found items to separate the document into separate sections. Shiiyama does not disclose or suggest searching the electronic version to find occurrences of items that correspond to the defined subsection delimiter. Nor does Shiiyama disclose or suggest using the found items to separate the document into separate sections.

For the foregoing reasons, **claim 18**, as well as **claims 19 and 20** which depend therefrom, is unanticipated and unobvious in light of Shiiyama.

Additionally, the Office Action offered no reason for rejecting **claims 19 and 20**. **Claim 19** recites defining a subsection delimiter comprises at least one of building a subsection delimiter from a list of predetermined potential subsection delimiter components, entering a subsection delimiter through keyboard strokes, entering a subsection delimiter by selecting symbols on a displayed portion of the electronic version of the document, and designating at least one demarcation point on at least one displayed portion of an electronic document to create a list of demarcation points to be

used as a set of delimiter definitions. It is respectfully submitted that Shiiyama does not disclose or suggest any of these methods for defining a subsection delimiter.

For the foregoing additional reasons, **claim 19** is unanticipated and unobvious in light of Shiiyama.

Claim 20 recites defining a subsection delimiter comprises marking a paper version of the document with at least one special demarcation symbol prior to scanning the document. Shiiyama does not disclose or suggest marking a paper version of a document with at least one special demarcation symbol prior to scanning the document or at any other time.

For the foregoing additional reasons, **claim 20** is unanticipated and unobvious in light of Shiiyama.

The Claims are Unobvious

Claims 2 and **7** were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of Goach. **Claims 2** and **7** depend from **claim 1** and are unobvious for that reason.

Additionally, in rejecting **claim 2** the Office Action admits that Shiiyama fails to teach that determining a subsection delimiter comprises indicating at least one of a font size, a font, a text string, a text location, a symbol, and a specific point within a document. The Office Action asserts that Goach teaches a chapter delimiter for building an index of chapter titles for a document. However, the Office Action does not assert that Goach discloses or suggests that determining a subsection delimiter comprises indicating at least one of a font size, a font, a text string, a text location, a symbol or a specific point within the document. Goach does not disclose or suggest any method for determining a subsection delimiter. Goach merely uses the phrase "chapter delimiter" without any explanation as to what a chapter delimiter is or where a chapter delimiter comes from.

Furthermore, it is respectfully submitted that there is no motivation in the art or in the references themselves to combine the references or to modify the teachings of Shiiyama with the teachings of Goach. Any motivation to do so can only be found in the present application. Therefore, combining the references can only be based on impermissible hindsight reasoning.

For the foregoing additional reasons, **claim 2** is unanticipated and unobvious in light of Shiiyama and Goach taken alone or in any combination.

In rejecting **claim 7**, the Office Action admits the Shiiyama fails to disclose selecting an exemplary subsection title, performing an OCR on the selected exemplary subsection title and using at least one recognized property of the exemplary subsection title as a subsection delimiter definition. The Applicant respectfully agrees. The Office Action goes on to assert that Goach discloses a chapter delimiter for building an index of chapter titles for a document. However, Goach's disclosure of a chapter delimiter is not a disclosure of selecting an exemplary subsection title, performing one of document recognition and optical character recognition, on the selected exemplary subsection title and using at least one recognized property of the exemplary subsection title as a subsection delimiter definition. For the foregoing reasons, the references taken alone or in combination do not disclose all the elements recited in **claim 7**. Therefore, for these additional reasons, **claim 7** is unanticipated and unobvious in light of Shiiyama and Goach taken alone or in any combination.

Claims 3 and 8 were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of Kitaori. **Claims 3 and 8** depend from **claim 1** and are unanticipated and unobvious for that reason.

Additionally, **claim 3** recites determining a subsection delimiter comprises using a symbol representing a demarcation point on a printed version of the document as the subsection delimiter. The Office Action admits that Shiiyama fails to teach that determining a subsection delimiter comprises using a symbol representing a demarcation point on a printed version of the document as the subsection delimiter. The Office Action asserts the Kitaori teaches that a period is used in a document, and a period can be used as a delimiter character. However, Kitaori discloses generating an electronic signature. Kitaori is non-analogous art with regard to the present application. One concerned with automatic generation of document indexes or tables of content would not look to Kitaori. Furthermore, it is respectfully submitted that Kitaori does not disclose or suggest a printed version of a document. Instead, Kitaori discloses only electronic messages stored, processed and manipulated in electronic buffers (FIG. 3; column 7, lines 43-55; Abstract; Table 1).

Claim 8 recites displaying a plurality of document pages on a user interface, selecting at least one demarcation point on at least one of the plurality of pages, and using the at least one demarcation point as the defined subsection delimiter. The Office

Action provides no specific reason for rejecting **claim 8**. However, it is respectfully submitted that neither Shiiyama nor Kitaori disclose or suggest displaying a plurality of documents on a user interface, selecting at least demarcation point on at least one of the plurality of pages, and using the at least one demarcation point as the defined subsection delimiter.

For the foregoing additional reasons, **claims 3 and 8** are unanticipated and unobvious in light of Shiiyama and Kitaori taken alone or in any combination.

Claim 6 was rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of Kujiraoka. **Claim 6** depends from **claim 1** and is unanticipated and unobvious for that reason.

Claims 9-15 were rejected under 35 USC §103(a) as being unpatentable over Shiiyama in view of Nakatani. **Claim 9** has been amended to recite a delimiter searcher operative to search for and record information regarding occurrences of items corresponding to a defined delimiter within an electronic version of a document and a document divider operative to divide the document into subsections based on the recorded information regarding the occurrences of items corresponding to the defined delimiter. In rejecting **claim 9**, the Office Action asserts that Shiiyama discloses a delimiter searcher to search for a defined delimiter within an electronic version of a document. The Applicant respectfully disagrees. As explained above, Shiiyama discloses searching an electronic document for strings of characters that match an entered character key. If, while searching for strings of characters that match an entered character key, the searcher of Shiiyama encounters a delimiter, special consideration or processing occurs for characters encountered between a first encountered delimiter and a second encountered delimiter. However, Shiiyama does not search for the delimiter nor does Shiiyama divide the document into subsections based on the occurrence of the delimiter. Instead, Shiiyama generates an index by manually entering character keys and recording the location of text matching, or possibly matching, the character keys.

Shiiyama fails to disclose or suggest all the subject matter for which it is relied upon. Therefore, the combination of Shiiyama and Nakatani fails to disclose or suggest all the subject matter for which they are relied upon.

For the foregoing reasons, **claim 9**, as well as **claims 10-17** which depend therefrom, is unanticipated and unobvious in light of Shiiyama and Nakatani taken alone or in any combination.

The Office Action fails to provide any specific reason for rejecting **claims 10-14**. **Claim 10** recites a user interface operative to transfer information between a document processor operator and portions of the document processor and a delimiter designator module operative to communicate with the document processor operator through the user interface in order to generate at least one delimiter designation. It is respectfully submitted that neither Shiiyama nor Nakatani disclose or suggest such a user interface nor such a delimiter designator module.

For the foregoing reasons, **claim 10**, as well as **claims 11-13** which depend therefrom, is unanticipated and unobvious in light of Shiiyama and Nakatani taken alone or in any combination.

Additionally, **claim 11** recites the delimiter designator is operative to accept an indication of at least one of a font size, a font, a text string, a text location, a symbol and a specific location within a document as delimiter designation. It is respectfully submitted that neither Shiiyama nor Nakatani disclose or suggest a delimiter designator operative to accept such an indication. **Claim 12** recites the delimiter designator is operative to display a plurality of document portions on the user interface for the document operator to view while determining the at least one delimiter designation. It is respectfully submitted that neither Shiiyama nor Nakatani disclose or suggest a delimiter designator operative to display a plurality of document portions on a user interface for the document operator to view while determining the at least one delimiter designation. **Claim 13** recites the user interface is operative to receive demarcation point designations from the document processor operator and deliver the demarcation point designations to the delimiter designator as delimiter designations. It is respectfully submitted that neither Shiiyama nor Nakatani disclose or suggest the user interface operative to receive demarcation point designations from a document processor operator.

For the foregoing additional reasons, **claims 11-13** are unanticipated and unobvious in light of Shiiyama and Nakatani taken alone or in any combination.

Claim 14 recites the delimiter searcher is operative to search for a defined delimiter comprising a symbol selected from a bar code and a data glyph. Neither Shiiyama nor Nakatani disclose or suggest a defined delimiter comprising a bar code or a data glyph.

For the foregoing additional reasons, **claim 14** is unanticipated and unobvious in light of Shiiyama and Nakatani taken alone or in any combination.

Claim 17 was rejected under 35 USC §103(a) as being unpatentable over Shiiyama as modified by Nakatani and in further view of Herregods. **Claim 17** depends from **claim 9** and is unanticipated and unobvious for that reason.

CONCLUSION

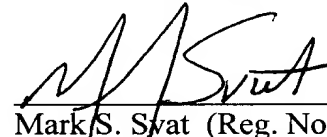
Claims 1-20 remain in the application. **Claim 21** has been added. For the reasons cited above, the application is in condition for allowance. Accordingly, an early indication thereof is earnestly solicited.

Telephone Interview

In the interests of advancing this application to issue and compact prosecution, the Applicant respectfully requests that the Examiner telephone the undersigned to discuss any of the foregoing with which there may be some controversy or confusion or to make any suggestions that the Examiner may have to place the case in condition for allowance.

Respectfully submitted,

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Attachment(s): Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1, 4, 7, 9 and 18 have been amended as follows:

1. (Amended) A method operative to automatically generate an index for a document, the method comprising:

determining a sub-section delimiter definition;

searching the document to find occurrences of items corresponding to the defined sub-section delimiter; and,

creating the index for the document from the found items corresponding to the sub-section delimiter occurrences.

4. (Amended) The method operative to automatically generate an index for a document of claim 1 wherein searching the document comprises:

generating an electronic version of the document; and,

searching the electronic version of the document for one of characters and objects that match corresponding to the defined sub-section delimiter .

7. (Amended) The method operative to automatically generate an index for a document of claim 1 wherein determining a sub-section delimiter definition comprises:

selecting an exemplary sub-section title;

performing one of: document recognition and optical character recognition on the selected exemplary sub-section title, and

using at least one recognized property of the ~~exemplary~~ exemplary sub-section title as a subsection delimiter definition.

9. (Amended) A document processor operative to automatically generate an index for a document, the document processor comprising:

a document input device operative to provide an electronic version of a document;

a document storage device operative to store the electronic version of the document;

a delimiter searcher operative to search for and record information regarding occurrences of a defined delimiter within the electronic version of the document; and

a document divider operative to divide the document into sub-sections based on the recorded information regarding the occurrences of items corresponding to the defined delimiter.

18. (Amended) A method for dividing a document into separate sections, the method comprising:

scanning the document to generate scanned document data;

performing recognition functions on the scanned document data to generate a recognized version of the document ;

defining a sub-section delimiter;

searching the recognized version to find occurrences of items that correspond to the defined sub-section delimiter; and,

using the found sub-section delimiter occurrences items to separate the document into the separate sections.

Claim 21 has been added.

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